Morphological and optical characteristics of porous silicon structure formed by electrochemical etching

Abstract:

Porous silicon (PS) structures are prepared by electrochemical etching method using HF and ethanol as a electrolyte solution. The surface and cross-sectional morphology and optical characteristics of the formed PS structures as a dependence of the anodization time are studied. Although the anodization time is changed from 1 minute to 5 minutes in a sequence of 1 minute, the chemical reaction in the prepared solution is fast enough to create pores with remarkable changes in diameter and depth. It suggests that the anodization time of 5 minutes may produce PS structures with smaller grain size compared to the other samples and supports a blue shift of emission peak. The occurrence of blue shift may due to the quantum confinement effect.